On the Road to an Entrepreneurial Economy: A Research and Policy Guide

Version 2.0

July, 2007

Ewing Marion KAUFFMAN Foundation

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EXECUTIVE SUMMARY

Among the factors contributing to the success of the U.S. economy over the past decade—as reflected in the doubling of productivity growth compared to the preceding two decades—is the continued transformation of the U.S. economy toward a more entrepreneurial form of capitalism. In such a system, innovative new firms play an unusually central role in developing and commercializing the radical technologies that provide the underpinnings to whole new ways of doing things and enjoying life. In the last century, innovations which have changed the social and economic landscape in the United States and in much of the rest of the world, such as the automobile, airplane, air conditioner, the personal computer and its operating system, and, most recently, many of the leading Internet-based business models, all were commercialized by entrepreneurs.

The United States and other countries face daunting challenges in this century. Aging populations and the retirement and medical needs they require, global warming, and new security concerns—to name just a few—all demand the resources that can come only from continued rapid economic growth. Economic growth, in turn, will require continued entrepreneurial innovation. Ideally, much of that innovation and entrepreneurship will take place here in the United States, where it historically has occurred.

How best can this outcome be assured? For over a decade, the Ewing Marion Kauffman Foundation has been supporting basic research into this and related questions surrounding entrepreneurship. The officers and staff of the Kauffman Foundation are in constant touch with all elements of the entrepreneurial community.

In the essay that follows, we distill what we've been learning through the research we sponsor and the feedback we receive from entrepreneurs, both

about the specific challenges to continued innovative entrepreneurship that confront the United States in the coming years, and how those challenges might be addressed. In particular, we outline some of our views on policies that we believe the best research suggests are likely to be most conducive to innovative entrepreneurship, as well as those subject areas that could benefit from future research.

We concentrate primarily on the following four policy subjects that innovative entrepreneurs have been telling us are of uppermost importance to them.

1. **Ensuring a Skilled Workforce**: Entrepreneurs tell us that perhaps the most significant constraint on their future growth, and on the growth of future entrepreneurs, is the difficulty finding and attracting "talent"—highly skilled, entrepreneurial workers. This also looms as one of the more important challenges facing the U.S. economy. Meeting this challenge will require major, entrepreneurially driven improvements throughout our educational system (K–12 through graduate school) that allow more choices for students and their families; improved schools from which to choose; accelerated learning opportunities; increased funding for college and graduate-level training; and research and development in engineering and the physical sciences. In addition, the nation could benefit from more enlightened immigration policies, designed to attract and retain highly skilled foreign workers and potential entrepreneurs to start and work for new businesses here.

2. **Reforming Health Care**: The continued escalation of health care costs, coupled with the uncertainties about future trends in these costs, rank high on entrepreneurs' lists of concerns, as well as on those of American business generally. In addition, the fear of losing health care insurance compounds workers' anxieties about job loss itself, and most likely deters some employees from leaving their current jobs to launch new enterprises. The most entrepreneurial approach the federal government could take to address these problems would be to untether health insurance from employment, a system that stems from an accident of history (explained in the text). The current administration has proposed one way of doing that: extending tax deductibility of health care insurance to those who purchase health insurance on their own, funded by an effective cap on the tax deduction for employer-provided health care coverage. Other approaches are surely possible. However accomplished, a new health care system should be one in which individuals buy insurance for health care as they currently do for other types of events (such as damage to their personal property, homes, or businesses), although they might do so through any number of non-employer groups or associations. Meanwhile, for their part, insurers should not be permitted to deny coverage or discriminate in setting their premiums on the basis of individuals' preexisting health conditions.

3. **Promoting Innovation**: Innovative entrepreneurship cannot occur unless the innovation pipeline is full and incentives for commercializing innovation are in place. Historically, the United States has done well on both these counts. But continued and ideally enhanced success requires even more: shifts in the patent system that reduce the likelihood that overly broad legal protection of "intellectual property" will inhibit the entry of innovative, new firms; improvement in the ways that university-developed ideas are commercialized; and monitoring of ideas and inventions developed abroad, just as foreign companies have been doing with U.S.-based inventions for decades.

4. **Limiting Overly Burdensome Regulation and Liability Litigation**: Because of their size, entrepreneurial firms often bear a disproportionate cost of regulation and liability litigation. Accordingly, entrepreneurs have the most to gain from generally sensible reforms that would require all major federal (and state) regulations to be implemented only if their estimated benefits exceed costs, and further that any regulations that pass this test also be designed to minimize costs in achieving their objectives. In addition, although progress has been made in reducing uncertainties associated with liability costs, further reforms would be useful (without reducing incentives for companies to make safe products). Three ideas in particular are worth serious consideration: enacting a federal product liability law to establish more uniformity and thus less uncertainty in liability rules for products sold in interstate commerce; adopting the "English rule" on attorneys' fees (loser pays) for litigations involving commercial interests on sides; and limiting the award of punitive damages where defendants have complied with prevailing regulatory standards.

At the conclusion of this essay, we briefly discuss two other policy subjects—taxes and regulation of the capital markets and corporate governance—that are likely to be important to promoting innovative entrepreneurship, but where we believe further research is required before offering policy recommendations.

This document is the second iteration of one released initially on February 26, 2007. It reflects comments on that first version received during several expert panels convened in Washington, D.C. during EntrepreneurshipWeek USA, as well as other comments transmitted to the Foundation via our Web site.

We continue to invite readers' views on the subjects advanced here. Are there other topics you believe are as or more important than those we concentrate on here for promoting the formation and growth of innovative entrepreneurial enterprises? Within any of these subject areas, are there particular questions you believe require further research? We'd like to hear from you. Comments can be emailed to research@kauffman.org or posted online at www.kauffman.org/policy. Periodic updates to this document will be posted online at this location.

INTRODUCTION

The U.S. economy has enjoyed remarkable success during the past fifteen years. Annual productivity growth has surged to a post-World War II high of nearly 3 percent, unemployment hovers near or below 5 percent, and inflation remains strikingly stable at close to 2 percent. Notwithstanding the terrorist attacks of September 11, the bursting of the dot-com bubble, concerns about the growing competitive threat from China and India, and escalating prices for oil and other commodities, most Americans enjoy higher wages and better living standards than economists would have predicted just a few short years ago.

But what accounts for our recent good fortune? Conventional economic wisdom credits the information technology (IT) revolution.[1] IT has certainly played an important role in our productivity growth and economic success over the last decade, but this explanation is insufficient to account for the substantial changes we have witnessed. A closer look at recent economic history reveals that while the best statistical studies document that the IT revolution has accounted for this acceleration in U.S. productivity growth, these studies ignore the forces behind this revolution: innovative, entrepreneurial companies, like Intel, Microsoft, eBay, and Google. In fact, innovative, entrepreneurial firms have become significant players throughout our economy, not only in the IT industry, but also in retailing, biotechnology, financial services, and many traditional manufacturing industries.[2]

The continuing emergence and growth of innovative companies in recent years stands in stark contrast to the dominance of large firms and unions in the decades immediately after the end of World War II, and also with the continuing dominance of large firms in Western Europe and Japan. Large, well-established firms play important roles in economies, mass-producing and incrementally improving "radical" innovative breakthroughs. But if history is any guide, it often

[1] There have been numerous studies documenting this link. See, e.g. Dale W. Jorgenson and Kevin Stiroh, "Raising the Speed Limit: U.S. Economic Growth in the Information Age," *Brookings Papers on Economic Activity*, 2000:1, pp. 125-240 and Stephen D. Oliner and Daniel E. Sichel, "Information Technology and Productivity," *Economic Review*, Third Quarter 2002, Federal Reserve Bank of Atlanta; and Kevin J. Stiroh, *Information Technology and the U.S. Productivity Revival: A Review of the Evidence*, Federal Reserve Bank of New York, January 2002.

[2] Some statistically-based evidence linking economic growth to measures of entrepreneurship, imperfect as they are, is emerging. But more research with better data (as they are developed) remains to be carried out to document the precise nature and magnitude of this connection. Nonetheless, the anecdotal evidence of the entrepreneurship-growth nexus is quite compelling and is the predicate of the analysis and policy suggestions advanced here. For two recent studies, see Zoltan Acs and Catherine Armington, *Entrepreneurship, Geography and American Economic Growth* (Cambridge, UK: Cambridge University Press, 2006) and David B Audretsch, Max C. Keihlbach, and Erik E. Lehmann, *Entrepreneurship and Economic Growth* (New York: Oxford University Press, 2006).

takes entrepreneurial firms to commercialize those radical innovations in the first place. Examples can be found everywhere in our society and economy today: the automobile, airplane, air conditioner, telephone, the personal computer and its operating system, and the continuing explosion of innovative companies doing business on the Internet.[3]

Our purpose here is to concentrate on the policy framework that can best promote the development and growth of these entrepreneurial enterprises—in short to sustain and deepen the transition away from the *managerial capitalism* of the 1950s and 1960s (when citizens and policymakers looked to large established firms to carry the economy) to the *entrepreneurial capitalism* of the last several decades and which we are currently witnessing today (where much driving force behind the economy's growth is being provided by rapidly growing new firms). This is not to ignore the importance of the many millions of smaller businesses whose owners intend for them to remain small or to grow only modestly. These firms also greatly contribute to our economy, while sustaining the lives of their proprietors and their families. But the relatively small fraction of all entrepreneurs who bring to market new or innovative products or services or means of producing or delivering them deserve society's special attention because these innovations deliver benefits widely throughout the economy, raising its productivity and the standard of living.[4]

The Ewing Marion Kauffman Foundation has supported public policy research related to entrepreneurship for many years. This essay, however, represents the first instance in which we derive insights from our own work and that of many of our grantees (along with numerous other researchers) that can help inform policymakers on how best to maintain, and ideally strengthen, our entrepreneurial economy.[5]

We concentrate on four topic areas that the entrepreneurs with whom we continue to interact tell us are the most important for achieving this objective:

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[3] The seminal study highlighting the importance of having a combination of both innovative entrepreneurs and well-established firms is that of William J. Baumol, *The Free Market Innovation Machine* (Princeton, N.J.: Princeton University Press, 2003). See also William J. Baumol, Robert E. Litan, and Carl J. Schramm, *Good Capitalism, Bad Capitalism, and the Economics of Growth and Prosperity* (New Haven, Ct.: Yale University Press, 2007, forthcoming).

[4] As it turns out, one commenter on the initial *Policy Roadmap* document suggested that the policies that are likely to be best suited for promoting the formation and growth of the "innovative" firms that are the primary subject of this essay also are likely to promote the formation and growth of the many millions of other smaller firms.

[5] For other entrepreneurship policy studies, see David M. Hart, ed., *The Emergence of Entrepreneurship Policy: Governance, Start-ups, and Growth in the U.S. Knowledge Economy* (Cambridge, U.K.: Cambridge University Press, 2003) and Douglas Holtz-Eakin and Harvey S. Rosen, eds, *Public Policy and the Economics of Entrepreneurship* (Cambridge, MA: MIT Press, 2004).

- ensuring a skilled, entrepreneurial workforce
- reforming health insurance
- promoting innovation
- limiting overly burdensome regulation and liability litigation

At the end of this essay, we briefly discuss two other policy subjects—taxation and the regulation of capital markets and corporate governance—which also may have an effect on innovative entrepreneurship in the future. As we noted in the Executive Summary, we invite readers to give us their feedback on the ideas outlined in this paper, as well as to give us their views on whether other subjects and specific policies are as important, if not more important, than those we concentrate on here.

The policies we discuss here build on institutions and laws that have successfully promoted entrepreneurship to this point: laws and systems that make it easy to start a new venture; the hiring of new workers and letting go of those who under-perform or whose skills do not match the constantly evolving needs of innovative enterprises; the removal of legal barriers to entry and price controls in a number of key industries—in particular transportation and telecommunications—which have dramatically cut costs and made it easier for new firms to get started and grow; legal changes that permitted pension funds to finance the formation and growth of new firms by investing in venture-capital partnerships; and legislation that accelerated (although not to its full potential) the commercialization of university research.

In addition, entrepreneurs and larger businesses alike benefit from our large internal market that offers economies of scale. We are also open to foreign goods, services, and capital. For the most part, we welcome immigrants and the innovative ideas they bring with them. At a more fundamental level, Americans have long perceived themselves as a nation of creative self-starters who welcome challenges and value individuality and self-reliance.

The challenge now is to maintain and strengthen our entrepreneurial economy and the growth it brings in order to meet the multiple economic challenges we now face: the increased competition from firms in other countries that also are adopting the entrepreneurial model for economic success (China and India, among others) and the aging of our population, which will put ever-increasing fiscal pressure on the federal budget.

Although the federal fiscal situation has significantly improved within the past two years, it will worsen substantially in the years ahead as baby boomers retire, unless major policy changes are made or the economy grows more rapidly than the federal government currently expects (at about 2 percent annually). As

Federal Reserve Board Chairman Ben Bernanke noted in January 2007, the recent improvement in the federal budget picture is the "calm before the storm," noting that "if early and meaningful action is not taken" in reforming Social Security and Medicare, then the "U.S. economy could be seriously weakened, with future generations bearing much of the cost."[6] Faster growth can help ease the fiscal pressure and reduce any tax increases and/or cuts in entitlement and other federal programs that may be required to keep the deficit from spiraling out of control. If the recent past is any guide to the future, promoting innovative entrepreneurship will be of central importance to realizing faster growth.

This document takes a national perspective, from the vantage of the U.S. economy in particular. Accordingly, it concentrates primarily on policy measures that the *federal government* can and should take to promote innovative entrepreneurship, although certain policies (notably those affecting education) are determined primarily at the state and local levels. Indeed, state and local governments hopefully can experiment with policies in other areas covered by this document that reinforce or anticipate and help shape what the federal government may do.

Further, the subjects addressed here should be of interest to foreign audiences—citizens of other countries and their governments—as they seek to spark and develop their own versions of an entrepreneurial economy. Americans should applaud rather than fear this process, since measures that accelerate growth in the rest of the world not only benefit citizens in the countries where growth advances, but create new export opportunities for U.S. firms and potentially new products, services, and ideas that the United States can import for the benefit of our own firms and citizens. Healthy economies abroad also are likely to be stable polities, sharing the values of economic and political freedom that are central to Americans. Accordingly, an entrepreneurial world is one that not only serves the interests of those abroad, but is one which is very much aligned with the foreign policy interests of the United States.

We have benefited greatly from the input of many individuals in preparing this essay, which we intend to update as events warrant, and in reaction to readers' comments. In particular, in June 2006, in Washington, D.C., we convened a group of economists and policy experts to provide comments on an initial draft. In October 2006, the editors of *Inc*. magazine hosted a second session of commentary, this time by leading entrepreneurs. We thank all those who attended these sessions and provided us with constructive feedback, as well as others who provided written comments on earlier drafts.

[6] These statements were made in testimony in January before the Senate Budget Committee, and were highlighted in Brian Blackstone and Henry J. Pulizzi, "Bernanke Warns About Deficit, Higher Entitlement Spending," *Wall Street Journal*, January 18, 2007. For a thorough analysis of the long-term fiscal challenges facing the country, see Congressional Budget Office, *The Budget and Economic Outlook: An Update*, August 2006.

We also want to thank all of those who attended the expert panels that were organized around the themes in this document during the last week of February 2007 in Washington, D.C. as part of Entrepreneurship Week USA, and those who wrote in to provide comments on that document. This Version 2.0 reflects these comments as well.

Readers should be aware that the views expressed here are those of the staff who have prepared the document, which does not necessarily reflect the official view of the Kauffman Foundation itself, or its officers or trustees.

ENSURING A SKILLED, ENTREPRENEURIAL WORKFORCE

At its most fundamental level, entrepreneurship is about the successful development and commercialization of novel ideas. This process is impossible without the highly creative and highly educated individuals who will be tomorrow's high-impact entrepreneurs. Equally important, however, are the innovative and skilled individuals who will work for these entrepreneurs, refining, producing, marketing, and distributing the products and services that entrepreneurs themselves develop. Indeed, an increasing number of existing companies, especially in the high-tech industries, recognize talent as a scarce commodity and see the (now global) "war for talent" as a large part of their strategic planning.[7]

We do not view "talent" simply as high-skilled cogs in an economic machine, but rather as those who will create, design, market, and commercialize the technologies, products, and services of the future. If we are to meet the growth challenge, this country requires highly skilled *entrepreneurial talent*—workers who not only have twenty-first century skills and knowledge, but who have no fear in putting those skills to work to generate and to *commercialize* (or help commercialize) new ideas, products, and services.

Indeed, it is becoming increasingly clear that having an entrepreneurial mindset and perspective is critical not only for entrepreneurs themselves and policymakers who desire entrepreneurial innovation, but for all members of society, regardless of whether or not they own a business. We live in an increasingly global environment in which firms will hire individuals wherever they live and individuals will change jobs many times during their working lives. In order to compete for jobs on an international level, individuals, more than ever before, need to view themselves as their own "firms," selling their labor to others or to themselves, should they want to start their own businesses. In the end, entrepreneurial mindsets will allow us, as individuals, to direct our careers toward success and fulfillment and, as a society, to ensure that continued innovation and growth support the nation's future.

[7] Adrian Wooldridge, "The Battle for Brainpower," *The Economist*, October 7, 2006.

Broadly speaking, there are two sources of entrepreneurial talent: American citizens and immigrants. The policy challenges relating to each are very different.

Educating Our Future Entrepreneurs

A strong education system—primary, secondary, college, and post-college—plays a vital role in the development of the human capital necessary to ensure a steady stream of entrepreneurial activity. At the Kauffman Foundation, we believe effective math, science, and technology education is even more necessary in this century than before, for most innovations of the future will require these skills, both for the entrepreneurs and those who work for them. At the same time, the traditional humanistic skills of reading, understanding history, and appreciating culture are also critical. People are most creative where they have both technical mastery and a broad understanding of their culture and its history.

America owes much of its economic success to its enviable record in providing universal primary and secondary education to its citizens, and perhaps even more importantly, to the development of its widely admired university system. There are, however, numerous disturbing signs in American education—principally at the primary and secondary level—that collectively raise serious concerns about the kind of society the United States will become in future years. As a number of recent reports have documented:[8]

- American pre-college students lag well behind students in other countries in international tests in mathematics and science.
- Nearly one-third of high school students in this country do not finish within the standard four years or drop out altogether.
- There are wide and, by some accounts, widening disparities in educational achievement among students of different racial, ethnic, and socioeconomic backgrounds in this country.

These trends have a direct bearing on the United States' ability to continue to develop a creative and skilled population that will generate future entrepreneurial enterprises. But these trends are also troubling at another level. The amount and quality of education is a strong predictor of lifetime earnings. A society with widening gaps in educational achievement among students today, therefore, will

[8] See, e.g. National Center on Education and the Economy, *Tough Choices For Tough Times: The Report of the New Commission on the Skills of the American Workforce* (Washington, D.C.: National Center on Education and the Economy, 2006) and National Academy of Sciences, *Rising Above The Gathering Storm: Energizing and Employing America for a Brighter Economic Future* (Washington, D.C.: The National Academy of Sciences, The National Academy of Engineering and The Institute of Medicine, February 2006).

be a society where income inequality rises even further in the future, aggravating a trend that has been evident since at least the late 1970s. Not only can further inequality stretch the social fabric of a nation, but also it courts a political backlash that can lead to the adoption of policies that inhibit entrepreneurship and growth.

In addition to the systemic problems within our country's educational system, there is concern that the school curriculum fails to foster not just excellence in science and mathematics, but also creativity and entrepreneurial mindsets among students. At the primary and secondary level, there is little encouragement of entrepreneurial thinking or opportunity-recognition. At the university level, the study of entrepreneurship typically is relegated to business schools and is not part of the educational experience for most students.

Much has been written about how to improve America's system of primary and secondary education. The small contribution that this essay may be able to make to the ongoing debate over educational reform is to provide an entrepreneurial perspective to the discussion. In brief, that perspective translates into four basic principles, which nonetheless imply potentially profound changes in public education:

1. Policymakers should allow educators to be as entrepreneurial as individuals in the rest of our society, and should reward them for doing so. A more entrepreneurial culture at schools will motivate current teachers to be innovative and will help attract the next generation of well-trained teachers.

2. Policymakers should permit families and their students to have a similar, and ideally the same, level of freedom in the education arena as they do in buying other goods and services in a free economy. Just as entrepreneurs cannot be successful unless they can persuade consumers to purchase the goods and services the entrepreneurs provide, so too schools should compete for students and families to choose the education they offer.

3. Policymakers should encourage schools (especially at the university level) to emphasize the study of the role and contribution of entrepreneurship in building the American economy and society, and to infuse creativity and entrepreneurial opportunity-recognition skills more deeply in our educational culture and disciplines.

4. Federal policymakers in particular should devote more resources toward training and funding the research of future scientists and engineers, since innovative entrepreneurs and those they hire should increasingly come from their ranks.

Promoting Entrepreneurship in Education: America's educational system is a long way from embracing entrepreneurship as a central organizing principle. Indeed, it is not an overstatement to say that the public school system, as it is currently structured, is anti-entrepreneurial.[9] Superintendents and principals are circumscribed by certification, hiring, and firing rules that are beyond their control and set by government policies and union contracts. Teacher compensation is almost universally unrelated to job performance. This system does not serve the interests of either students or teachers and sends a bad signal to would-be teachers that innovative thinking and teaching is not rewarded in the school workplace.

The good news for parents and their children is that the public school system could be made more entrepreneurial, even within some of the tight limitations that currently exist, and in a manner that preserves and indeed strengthens public school systems. School boards could give school principals much broader freedom to run their schools the way that owners of private enterprises operate them. Ideally, policymakers would change or negotiate change in the rules themselves so that principals would not be bound by current principal and teacher certification requirements. For example, principals, like business owners, could hire and fire based on actual job performance. One limited idea would be to permit public school systems and principals to hire teachers under the condition that—after some test period (say, two years)—their classroom performance proves adequate. If teachers fail to meet this standard, they would complete additional pedagogical training.[10]

Public education also could become far more entrepreneurial if it welcomed educational entrepreneurs. Policymakers should embrace new public "charter schools" and not tie them down with a web of regulations that stifle their ability to respond to parent and student demands. There is and will continue to be a range in performance of charter schools, just as there is among traditional public schools and as there is in every market. Those schools that perform well will survive because they deliver the achievement that parents want; those that fail to meet parent and student demands should be closed quickly and efficiently by charter school authorizers. This simple lesson is one that entrepreneurs know from the outset of their ventures and live with every day.

Educational entrepreneurship could bring a much wider set of options for both students and their parents. Among the possibilities: high schools that are open in late afternoon through early evening; rapidly accelerating students through the school curriculum based on their achievement; greater use of project-based learning (including extended projects, which may take up to a year to complete

[9] For an excellent set of papers on how to enhance entrepreneurship in K–12 education, see Frederick Hess, ed., *Educational Entrepreneurship: Realities, Challenges, Possibilities* (Cambridge, Mass.: Harvard Education Press, 2006).

[10] Gordon, Robert, et al., "Identifying Effective Teachers Using Performance on The Job," Hamilton Project White Paper 2006-01, The Brookings Institution www.brookings.edu.

and involve extensive engagement with a diverse set of subjects); wider use of student interchanges with schools from other countries; and wider use of community-based mentors, job shadowing experiences, and paid student internships in companies. The use of these different approaches should be coupled with rigorous evaluations of what works and what doesn't.

The Freedom To Choose: Families ought to be able to choose, at least within the public system, where to send their children to school. Choice will only be meaningful, however, if parents and students have a range of desirable options from which to choose. If principals are allowed to operate like owners of firms, and the equivalent of new educational "firms" (schools) are permitted to enter the market, then parents and students will have more effective choices than they currently have.

Choice is not just about equity, or giving parents who may be unable to afford to move into a more desirable neighborhood the ability to send their children to a better school; it is also about incentives. Entrepreneurs would not exist without incentives, namely the rewards a capitalist system makes available to them if their ideas succeed in the marketplace. It is time to apply this simple insight to public education. If the providers of education know that students and their families have the ability to choose, they will have stronger incentives to provide quality education than if students must attend the schools in their neighborhood. There are, of course, a host of issues raised by choice—how to inform parents, how to address the educational needs of students left behind in unpopular schools, and so on—that require further research.[11] In the meantime, however, the need for further research should not prevent school districts from continuing to experiment with a variety of school models.

The suggestions outlined as part of these first two principles are consistent with an entrepreneurial view of education. By encouraging improvement on the "supply side" and expanding choice on the "demand side," they will also narrow the gaps in educational achievement between students of different socioeconomic backgrounds, one of the national objectives embodied in the No Child Left Behind Act.

Teaching Entrepreneurship and Other Key Skills: There is a running debate in some circles over whether entrepreneurship—in essence, creative thinking and prudent risk-taking—can be taught or is inherited. The truth, of course, is that both are important. But entrepreneurship is no different than any other skill people are born with: it can be, and is likely to be, useless unless the skill is developed through education and experience.[12]

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[11] See Center on Reinventing Public Education, *Doing School Choice Right: Preliminary Findings* (University of Washington, April, 2006).

[12] Further, entrepreneurs need a general education. In 2002, according to the *Survey of Business Owners* published by the Census Bureau, 64 percent of business owners had at least some college education. Virtually all of the companies listed on the annual *Inc 500* list of rapidly growing

This implies that a central task for educators and policymakers is not only to give students the key skills to thrive in any work environment—reading, math, science, technology and history—but also to nurture whatever creative and entrepreneurial skills each of us has by birth. Programs that teach basic entrepreneurial skills to middle and high school students may be especially valuable for children from disadvantaged backgrounds, and may be one way to encourage their interest in academic achievement more generally. At the college level, universities need to infuse entrepreneurship and creativity more deeply into their curricula, for both students majoring in business and those in other subjects.

It is an encouraging sign that the August 2006, report of the Secretary of Education's Commission on the Future of Higher Education recommends, in part, that universities embrace a culture of continuous innovation to improve learning, especially in mathematics and science.[13] This curriculum and pedagogical innovation should be broadened to acquaint all university students with the opportunities offered by entrepreneurial careers and to equip those who are so inclined to pursue entrepreneurial ventures (in new companies or within existing companies) to be successful in these endeavors. This Foundation is devoting significant resources to assist enterprising universities in spreading entrepreneurship "across campus"—and thus across schools and disciplines—and encouraging state governments to support similar initiatives at all their universities and community colleges.

Although education policy is largely a state and local responsibility, it is clearly a national priority, and there are important educational improvements that can be accomplished at the federal level. For example, the federal government has the resources and is in the best position to fund necessary research into what is woefully lacking: a better understanding of the teaching approaches and methods that work best to promote learning and creativity. Moreover, the disappointing national trends in math and science achievement by students in primary and secondary schools should spur policymakers at all levels of government to take corrective action. Among the many welcome ideas are proposals to provide better financial incentives to attract teachers of math and science, including those workers with expertise in these areas who are currently not teaching but want to; further training of existing teachers in math and science who want to take advantage of it; and openness by school systems, principals and teachers to the use of new approaches and technologies for the teaching of math, science, and technology that could enhance students' interest and knowledge in these subjects.

Enhancing Federal Support for the Training of and Research by Scientists and Engineers: Finally, to turn out more innovative entrepreneurs in an age of

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firms in the United States are headed by individuals with college degrees, many with advanced degrees.

[13] U.S. Department of Education. *A Test of Leadership: Charting the Future of U.S. High Education,* Washington, D.C., 2006.

ever-increasing technological sophistication, it will be necessary to train more people to be engineers and scientists, some of whom will start new enterprises and others who will work for them—right out of school or after research careers in academia or the private sector. Although as suggested in the next section, it is important to welcome foreign nationals to this country to receive this training, it is just as important to induce American citizens to do so. Since 2000, there have been more foreign students than U.S. citizens studying engineering, the physical sciences, and mathematics at the graduate level at U.S. universities, and although the gap has narrowed somewhat since then, that is most likely because of post September 11 immigration restrictions and not because of an improvement in the U.S. numbers.[14]

If policymakers want more scientists and engineers, they will have to pay for them.[15] The best way to do that is to substantially increase the numbers and value of fellowships for graduate study in these fields. Professor Richard Freeman of Harvard University has proposed tripling the number of graduate fellowships awarded by the National Science Foundation (NSF) from the current 1,000 to 3,000, and increasing the average award from roughly $40,000 (split three-fourths to the student and one-fourth for the university) to $54,000. The trebling of fellowships and the increase in the average award, he calculates, would cost roughly $500 million a year, and restore the ratio of graduate fellows to the number of undergraduate science and engineering majors to where it was right after the launching of Sputnik by the Russians (which was the last major external event to wake America up to the scientific challenges it faced).[16] The added funding could be especially important in the effort to attract more talented African-Americans and Latinos into science-related careers and starting technology-based companies, endeavors where they are now significantly underrepresented.

Would there be sufficient demand for the additional engineers? The traditional way to answer that question is to look at likely future spending by the federal government and private sector on research and development activities, which make use of engineering and scientific talent. On these measures, the outlook is promising. For over three decades, the share of Gross Domestic Product (GDP) represented by federal support for research and development in the physical

[14] See The Task Force on the Future of American Innovation, *Measuring the Moment: Innovation, National Security, and Economic Competitiveness*, November 2006.

[15] One commonly cited justification for increasing the numbers of U.S.-educated engineers is that China and India are turning out vastly more of them. But the definition of "engineer" in India and China includes many individuals with lesser skills than the typical engineering college graduate in the United States. As a result, while both countries have made major strides in improving their numbers of engineers, the alleged imbalance between those in the United States and those in these two particular countries is significantly overstated. See Vivek Wadhwa, et al., "Seeing Through Preconceptions: A Deeper Look at China and India," *Issues in Science and Technology*, Spring 2007.

[16] Richard B. Freeman, "Investing in the Best and Brightest: Increased Fellowship Support for American Scientists and Engineers," Hamilton Project Discussion Paper, The Brookings Institution, December 2006.

sciences and engineering has been declining.[17]The administration has proposed a ten-year "American Competitiveness Initiative" that would reverse this trend, by among other things, doubling NSF funding (from $5.6 billion to $11.2 billion). The initiative also proposes $86 billion over ten years in R&D tax incentives, which should increase private sector demand for scientists and engineers.

But indicators of future R&D spending are likely to understate the demand for engineers and scientists because they do not take account of the entrepreneurial activities that many of these highly trained individuals are likely to undertake. And as they do, they will add to the demand for other engineers, scientists, or mathematicians.

The hiring of individuals with these backgrounds by such companies as Microsoft and Google is well known. But another entrepreneurial success story in our own backyard, in a Kansas City suburb, illustrates how the commercial application of sophisticated technology, led by engineers, can also lead to a rapidly growing demand for individuals with similar backgrounds. The story is the spectacular rise of Garmin Industries, now the world's leader in developing and marketing navigational products (using Global Positioning Systems technology), an "industry" that didn't exist before Garmin invented it.

Started in 1989 by two engineers who designed a civilian GPS navigational device whose first real market was in the U.S. military (then fighting the first Gulf War), Garmin now makes the navigational equipment found in many new automobiles, and is rapidly expanding its products for other environments and uses. As demand has exploded, so has Garmin's employment, currently at 3,500, many of them engineers.

If the United States wants more Googles, Microsofts, and Garmins—and it surely does—it will need to produce more engineers and scientists. That will take more money, but not a huge amount by current Washington standards. And the benefits almost surely will far outweigh the costs.

An "Entrepreneurial" Immigration Policy

While improvements in education are essential to equipping American citizens with entrepreneurial skills, educational reform is difficult and a long-term project that will only produce meaningful results over the long-run. In the meantime, immigration represents an opportunity to bring additional talent into the country immediately and for the near future.

There is little doubt, for example, of the value of highly trained immigrants. Foreign-born scientists and engineers historically have contributed significantly to the growth of U.S. high-tech industries. The U.S. nuclear and space programs,

[17] Task Force on the Future of American Innovation (2006).

for instance, benefited enormously from the immigration of foreign scientists both before and after World War II.

In addition, as just noted, we continue to attract foreign-born scientists today, often through the science programs in American universities. In the last several decades, in fact, roughly half of all those who earned an undergraduate or graduate degree from American universities in science, engineering, computer science, and other technology-related fields were foreign students.[18] But with Asia and Europe now wooing highly qualified students (and even senior-level researchers) from other countries to their universities and easing restrictions on the entry of skilled workers,[19] the United States faces increased competition in drawing the world's best and brightest to study, work, and start businesses here.

Immigrants already play a key role in our entrepreneurial economy:

- Census data indicate that immigrants as a group have had consistently higher rates of business formation than native-born individuals for many years.[20]

- Immigrants from China and India helped create 24 percent of technology companies launched in Silicon Valley between 1980 and 1998.[21]

- According to the National Venture Capital Association (NVCA), since 1990, one in four venture-backed firms in the entire country has been started by immigrants. The NVCA estimates that these firms have created more than 400,000 jobs and collectively represent a market capitalization of roughly $500 billion.[22]

- Most recently, a team of researchers at Duke University and the University of California at Berkeley found that between 1995 and 2005, immigrants founded or co-founded 25 percent of all the high-tech firms in the United States, and accounted for 24 percent of international patent applications from the United States in 2006.[23]

[18] Freeman, December 2006.
[19] *Economist*, p. 12.
[20] Robert W. Fairlie, *Kauffman Index of Entrepreneurial Activity: National Report*, *1996-2005*, Ewing Marion Kauffman Foundation, 2006.
[21] AnnaLee Saxenian, *Silicon Valley's New Immigrant Entrepreneurs* (San Francisco, CA: Public Policy Institute of California, 1999).
[22] Stuart Anderson and Michaela Platzer, "American Made: The Impact of Immigrants and Professionals on US Competitiveness." http://www.nvca.org/pdf/AmericanMade_study.pdf
[23] Vivek Wahwha, AnnaLee Saxenian, Ben Rissing and Gary Gereffi, *America's New Immigrant Entrepreneurs* (Master of Engineering Management Program, Duke University and School of Information, University of California at Berkeley, 2007).

- More broadly, immigrants are making major contributions to the growth of cities around the country.[24]

Despite the clear importance of skilled immigrants to generating new firms in this country, since September 11, U.S. immigration authorities have tightened legal immigration in the name of national security. While national security needs, of course, are of paramount importance, it must be possible without posing a national security threat to make it easier and to reduce delays for permitting entry of immigrants from most countries who are seeking higher education and skilled jobs here. This limited objective is something that can be accomplished even if Congress does not pass more comprehensive immigration reform.

In particular, quotas for H1-B visas (those for workers with specialized skills) should be raised significantly, and ideally eliminated altogether. In fact, until 1990, there were no limits on immigration of skilled foreign workers. In that year, however, Congress imposed an annual ceiling of 65,000 skilled foreign workers.

But *any* such ceiling imposes a self-inflicted wound on our economy. Already there is evidence that entrepreneurial firms have put more of their personnel abroad because of an inability to obtain H1-B visas for foreign workers.[25] Moreover, because H1-B visas are time-limited, they cannot permit highly skilled immigrants to start new businesses.

For a country seeking to maintain its entrepreneurial momentum, the doors to skilled immigrants should be far more open than they are now. Given the unusual propensity of skilled immigrants to start entrepreneurial ventures, policymakers should provide *strong incentives* for foreign individuals who are most likely to launch these enterprises to immigrate to the United States and to remain here if they want.

One idea that would cost the federal government very little would be to grant permanent residency and work status, and perhaps even automatic citizenship, to those immigrants who come here to study mathematics, engineering, or the sciences upon receipt of their degrees from qualified institutions of higher learning.[26] These are precisely the individuals the United States should be seeking to attract and retain. The promise of a permanent work permit and perhaps citizenship upon satisfactory completion of their studies should be a powerful incentive for many to come. Even if some immigrants later decide to return to their home countries—as increasing numbers appear to be doing, which

[24] "A World of Opportunity," Center for an Urban Future, February 2007, available at www.nycfuture.org.
[25] Anderson and Platzer, 2006.
[26] This idea would constitute one "national strategic plan" for recruiting international students, a central conclusion of a recent report by the Government Accountability Office on consensus recommendations by a panel of national education experts. See Government Accountability Office, *Global Competitiveness: Implications for the Nation's Higher Education System*, Highlights of a GAO Forum, January 2007, www.gao.gov/new.items/d07135sp.pdf.

is also a good thing for these economies—the United States would have the benefit of their skills and entrepreneurial energy for as long as they remain here.[27]

One possible objection to this idea arises from the fear that more skilled immigrants would put downward pressure on the wages and incomes of Americans with similar skills. Whether and to what extent this effect occurs now or would occur in the future remains a matter of debate. Our own view is that if the additional skilled immigrants are anywhere near as successful in forming new businesses as those who have recently come, the added immigrants as a group are likely to create more demand for skilled workers, wherever they are born. This should minimize any downward pressure on wages and incomes of domestic workers, and indeed conceivably might even increase wages and incomes beyond where they would otherwise be.

In short, in a world where brainpower and skills lead to economic power, it is difficult to defend a policy that discourages talented, skilled workers from coming to the United States, to study, work, or launch new companies.

REFORMING HEALTH INSURANCE

Like most Americans, actual and would-be entrepreneurs are worried about health insurance—its soaring costs (that are widely projected to continue to outpace general inflation) and potential unavailability or limited coverage in the presence of preexisting conditions.

For current entrepreneurs seeking to grow their businesses, rising health insurance costs aggravate the difficulties of attracting employees with just the right set of job skills to fit into an entrepreneurial environment. Some of those who might otherwise qualify but are currently working at larger firms with well-established menus of health insurance options may find the uncertainties surrounding health insurance availability in the individual market or through entrepreneurial start-ups to be too great to take the risk of moving from their current jobs. By the same token, the fear of being unable to purchase any health care insurance at all because of preexisting conditions (or if so, only at very high rates) can inhibit would-be entrepreneurs from large companies from leaving to launch new enterprises.

Entrepreneurs who nonetheless offer some health care coverage to their employees find themselves at a disadvantage, because of their size, relative to

[27] The McKinsey report commissioned by the Mayor of New York on the financial services industry in that city also highlighted among its recommendations the need to attract and retain highly skilled immigrants to work in that industry in particular. McKinsey & Co., *Sustaining New York's and the US' Global Financial Services Leadership*, January 2007, www.nyc.govt/html/om/pdf/ny_report_final.pdf.

their larger competitors. Given their smaller workforces, entrepreneurial firms have smaller "risk pools," which means that insurers have greater difficulty projecting their costs and thus charge them higher premiums than for ensuring larger firms. Smaller companies must, therefore, choose not to offer health care, shoulder the additional cost burden by cutting into their profits, or shift the cost to their employees (either in higher health insurance premiums or in lower wages). Each of these options impedes entrepreneurs' ability to compete with larger enterprises.

New firms and would-be entrepreneurs are not alone in having concerns about rising health insurance costs. Established firms doing business in markets populated by competitors from other countries that do not have to shoulder health care expenses (either because health insurance is not offered in those countries by employers or because governments abroad assume health care costs) find themselves at a growing disadvantage as health care costs continue to climb.

Meanwhile, on top of any general concerns they may have of losing their job, millions of Americans who have insurance by virtue of their employment are anxious about the coverage they may or may not get once they find a new job. This anxiety, coupled with rising discontent over increased income inequality, if left unchecked, could aggravate the backlash already under way against open trade and globalization that would slow growth throughout the economy and reduce, rather than expand, opportunities for entrepreneurs to tap into global markets (for inputs and for sales revenue).

All of these problems and fears arise from one simple accident in American history: that employers began offering health insurance during World War II as a way of circumventing wage controls then in place, and employees were not required to recognize the health care benefit as part of their taxable income.[28] Once that genie was out of the bottle, more firms began offering health care coverage, creating our current employer-based system of health insurance.

There is very little that can be said to defend this system. It has led to the mounting problems for firms of all sizes just noted. It contributes to worker anxiety. It is highly regressive, since the non-taxability of health insurance coverage benefits upper income workers more than it does those with moderate or low incomes who are lucky enough to have health care coverage. Indeed, because some firms are able to offer "gold-plated" versions of health insurance with low deductibles, too many individuals have little or no incentive to shop carefully for medical care, which reduces the incentives for health care providers to be efficient.

[28] Initially this was a ruling of the Internal Revenue Service, but was later codified in the Internal Revenue Code by Congress in 1954. See David Gratzer, *The Cure: How Capitalism Can Save American Health Care* (New York: Encounter Books, 2006).

Logic compels one overarching principle, therefore, to guide health care insurance reform: untether health care insurance from employment. The most direct way to do this would be to phase out the tax policy that led to the current employer-based health insurance system. Employees no longer covered by their employer-provided plans would benefit from a rise in their real wages (roughly equivalent to the cost of health insurance previously paid for by their employer), which they would use to purchase health insurance on their own, or through any number of non-employer groups. Some portion of the resulting gain in federal revenues—roughly $125 billion—could then be used to support the health care insurance premiums of individuals with low to moderate incomes (with perhaps the rest devoted to reducing the federal budget deficit).[29]

An alternative approach, offered by the President as part of his State of the Union address in January 2007, would level the playing field between those who currently receive health care coverage from their employers and those who are self-employed or are not covered by their employers by extending tax deductions to individuals or households who purchase health insurance directly. The new tax deductions would be financed, in effect, by capping the tax benefits of employer-provided care.[30]

However the decoupling of health insurance from employment is accomplished, much worker anxiety would be reduced if insurers also were prohibited from denying insurance or discriminating in setting health insurance rates based on preexisting conditions (much as they now are prohibited from taking individuals' genetic traits into account). This would solve the preexisting condition problem that can lead to "job lock"—the fear of leaving a company to start a new enterprise but finding adequate health insurance unavailable.

Policymakers in both political parties are beginning to recognize the simple, but compelling, logic of separating health insurance from employment. But this will take time and much political energy to accomplish. The major reason that federal policymakers have not been able to reach consensus on health care insurance reform so far—despite numerous tries—is that any change from the status quo inevitably creates many "losers" even though it may improve coverage rates and potentially reduce costs in the health care system as a whole. The proposals just reviewed here are no exception to this pattern.

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[29] The revenue estimate is from the Advisory Panel on Tax Reform, which like the President's proposal outlined a cap on the deductibility of employer-provided health insurance.

[30] The caps would be implemented, however, by requiring individuals who receive health insurance through their employers to report the employer's payments as taxable income, and then giving them a standard deduction ($7,500 per individual, $15,000 per family) to offset this amount. The standard deduction would act as the "cap" on the tax incentives, since the roughly 20 percent of workers who currently receive employer-provided health care benefits greater than that level would end up paying higher taxes; the other 80 percent of workers with health care benefits costing less than this would realize a tax saving. White House, "Strengthening Healthcare," January, 2007.

If a stalemate at the federal level continues, health care insurance reform may continue at the state level. Already, a number of states have adopted or are actively considering plans to assure or mandate universal coverage. It is too early to determine, however, the extent to which these plans will be effective in actually assuring coverage, or controlling health care costs. In addition, in January 2007, a federal court struck down the Maryland law requiring employers above a certain size to provide health care coverage, on the grounds that the Employment Retirement Security Act of 1974 (ERISA) broadly preempted state benefit laws. If this ruling stands, then other states that are attempting to solve their health care problems through employer mandates may find that they cannot lawfully do so. In that event, either states will have to come up with other ways to expand coverage and reduce costs, or the federal policymakers will have to realize that only they can address these challenges.

Moreover, from an entrepreneurial perspective, while continued state-level experimentation with employer mandates, if legally permitted, may improve coverage rates, it would do little or nothing to address the problems created by linking employment with health insurance. A far better outcome for entrepreneurs, as well as other stakeholders in our society, would be a national system in which health insurance is bought and sold like other forms of insurance—independent of the workplace, and directly by individuals themselves.

FOSTERING INNOVATION

It has been well established through years of economic research that the most important driver of economic growth is innovation—the development of new products, services, and know-how that leads to greater output with any given level of employment and plant and equipment. A key predicate of this essay is that entrepreneurs launching new firms are responsible for a disproportionate amount of truly radical or transformative innovation, or the disruptive products and technologies that fundamentally alter economies and indeed entire societies.

One of the hallmarks of U.S. economic success is that our legal and social institutions and culture have been highly hospitable to innovative entrepreneurs. It is easy to launch and grow a business in this country, the rewards of success can be and often are enormous and are protected by our legal system, while the social and economic stigma of failure is nothing like what it is in other countries. (Indeed, it has been said that in Silicon Valley, and possibly elsewhere, having a business bankruptcy on one's resume is a sign of experience that can only help when seeking venture funding for another enterprise.)

Yet, as conducive to innovative entrepreneurship as our economy is, it is always possible to do better. Three ways for doing so follow.

Accelerating the Commercialization of University-Developed Innovations

The federal government currently spends $29 billion supporting scientific research at universities and colleges, up from $17.5 billion in 2000.[31] Although a large portion of this money is being spent to advance understanding of basic science, some of it eventually finds its way into commercial applications. In 1980, Congress encouraged this process of "technology transfer" by enacting the Bayh-Dole Act, which explicitly allows—indeed, encourages—universities and their faculties to commercialize federally funded research. This is clearly an appropriate objective. The ultimate aim of scientific research, after all, is to improve the human condition, and this result comes about through the commercial application of basic scientific discoveries.

Universities commercialize the innovations developed by their faculty largely through licensing of the intellectual property (typically patents) embodied in these breakthroughs, to entrepreneurs (sometimes the faculty themselves) and to established companies. Yet while university faculty and students subsequently have generated a range of innovations that have found their way into the market and have helped launch new companies—the Internet browser (Netscape), Internet search engine (Google), various biotechnologies (Genentech), being just a few examples—there are strong reasons for believing that the objectives of Bayh-Dole could be met even more effectively than they are today.[32]

For all the many billions of dollars the federal government has provided for basic science to universities and researchers throughout the country, commercialization of university research (whether judged by numbers of patents, licensing of revenue, or new companies formed) remains concentrated in just a handful of universities. Research at this Foundation suggests that this problem stems, in part, from the fact that universities generally have responded to Bayh-Dole by centralizing their commercialization activities through a single "technology transfer office" or "TTO." All university faculty members are required to work through these offices, leading to the traditional problems associated with all monopolies, which can become bottlenecks rather than entrepreneurial agents of real change.

There are many alternative models for these university technology transfer arrangements. For example, universities could allow their faculty to become the equivalent of "free agents." Faculty would use any third party of their choice (or themselves) to negotiate license arrangements for entrepreneurial activities, provided they return some portion of their profits to the university. In another model, the TTO could be retained, but forced to compete with third-party agents.

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[31] Figures are from the National Science Foundation, 2006, available at www.nsf.gov/statistics/infbrief/nsf07311/.

[32] For a more complete list of university-developed technologies and products, see Association of American Universities (AAU). "University Technology Transfer of Government-Funded Research Has Wide Public Benefits" http://www.aau.edu/research/TechTrans6.3.98.html.

Or a more radical suggestion would be for universities to give up their intellectual property rights entirely and rely on commercially successful faculty members to donate some of their profits back to the university (as some of them already have). [33]

The federal government, as the funding source for university-based research, is in an ideal position to encourage experimentation with these—and other—alternative arrangements. At a minimum, the government can help educate universities on the importance of providing a more fluid environment that would allow for more rapid commercialization of ideas developed by their faculty. More ambitiously, agencies of the federal government could condition their research grants on demonstrations by universities that they are experimenting with and using alternative approaches to providing competition or alternatives to their TTOs for commercializing research.

Experimentation with new models for accelerating university-based research should be of increasing importance. Although universities in the past have accounted for a relatively small portion of new high-tech ventures, the growing sophistication and complexity of technology should give university faculty a bigger seat at the entrepreneurial table in coming years, especially with the right set of policies.[34] Policies that move new university-developed technologies "out the door" and into the marketplace more rapidly can only have beneficial effects for the U.S. economy and society.

Intellectual Property Protection: Moving the Pendulum Back

Commercially useful innovation is encouraged when intellectual property laws—the laws that give legal protection to inventive technologies and original works of authorship—strike the right balance that gives inventors and authors sufficient incentives to bring their ideas to market, but do not pose unwarranted legal roadblocks to new entrants. Strong intellectual property laws protect entrepreneurs' ideas and ensure that they have the opportunity to reap the financial rewards for their innovations, providing an important incentive for radical innovation to occur and for inventors to commercialize. It is noteworthy that firms with less than 500 employees produce thirteen to fourteen times more patents

[33] See Robert E. Litan, Lesa Mitchell, and E.J. Reedy, "Commercializing University Innovations: Alternative Approaches," NBER Working Paper, February, 2007. A version of this working paper is scheduled to appear in a forthcoming issue of *Issues in Science and Technology.*

[34] Although current data suggest that university-based start-ups account for only 2-3 percent of overall start-ups, these data only reflect businesses reported by university TTOs. Because there are no data on university-developed businesses that are not reported to the TTO, the available data understate the current importance of businesses launched from universities. Furthermore, because university-based start-ups are likely to be more technology-based than start-ups in general, universities almost surely account for a larger share of innovative entrepreneurial endeavors (as the term is used here) than of all start-ups. See generally Audretsch and Phillips (2007).

per employee than larger firms, and that these patents are twice as likely as patents taken out by large firms to be among the 1 percent most cited (citations being a good measure of the commercial importance of a patent).[35]

At the same time, it is essential that *only truly non-obvious innovations* receive patent protection and that the length of the period of exclusive property protection is not too long. Otherwise, the legal system will enable existing firms to impose legal roadblocks in the way of new entrants, effectively handing out monopolies in exchange for little public benefit and making the economy less competitive and less innovative.

There is mounting, though not yet irrefutable evidence, that intellectual property protection, particularly patents, may have tilted too far in the "monopoly direction"—that is, toward creating inappropriate roadblocks that impede the competition that entrepreneurs and other entrants into a field can provide. Two problems in particular have been commonly cited.[36]

First, there is enormous pressure on an overburdened and overworked patent examiner staff at the United States Patent and Trademark Office (USPTO) to review the increasing number of patent applications—expected to top 400,000 in 2007—that are filed each year. With limited resources, patent reviewers have little time to do a thorough search of "prior art" to make well-informed decisions in every case as to whether a patent application represents something that is truly novel. As a practical matter, this can lead to the granting of some, and perhaps an increasing number, of non-deserving applications. If so, this is a problem since patent examiners' decisions are given a legal presumption of validity in the event they are later challenged in court, a process that is expensive and time-consuming. Indeed, the reason there are so many patent applications is that it is too easy to get patents in the United States because the invention standard is too low.

Second, as several scholars have argued, the consolidation of patent appeals in a specialized court, the U.S. Court of Appeals for the Federal Circuit (CAFC), in 1982, has had the effect, over time, of giving greater protection to patent claimants.[37] Among other steps, the court has allowed "business methods"—such as the Amazon "one-click" Internet payment system—to be patented. Amazingly, roughly 50 business method patents have been issued for strategies to minimize tax obligations. To be sure, the formation of the court also has led to somewhat more uniformity in patent rulings, which previously were handed down

[35] SBA Office of Advocacy, "Frequently Asked Questions," available at www.sba.gov/advo.
[36] For compelling critiques of the current patent system, see Adam B. Jaffe and Josh Lerner, *Innovation and Its Discontents* (Princeton, N.J.: Princeton University Press, 2004) and Keith E. Maskus, *Reforming U.S. Patent Policy-Getting the Incentives Right* (New York: Council on Foreign Relations, November 2006).
[37] See Jaffe and Lerner (2004) and Frederic M. Scherer, "The Political Economy of Patent Policy Reform in the United States," AEI-Brookings Joint Center on Regulatory Studies Working Paper 06-22, October 2006.

by the various federal courts of appeal that often differed with each other and which tended to work against those seeking patents. But the "price" paid for this reform increasingly appears to be excessive patent protection.

Academic scholars and official bodies (such as the Federal Trade Commission and the National Academy of Sciences) have advanced a number of proposals to address these problems and thereby restore some greater balance in the patent system.[38] Several suggestions seem especially meritorious:

- Providing more resources to the USPTO would help reduce the burden on overburdened patent examiners. Since it is unlikely that funds from other federal programs could be redirected to the agency, additional funding could be generated by raising fees on patent applications.

- Finding interesting ways of raising additional funds—or enabling the USPTO to operate more effectively within its current budget—such as implementing a two-tiered system of patent review.[39] Under this concept, all patent applications would pass through the first tier, but decisions by patent examiners would not be given the presumption of validity, which they get under the current system. Only if applicants sought and paid for an additional, more intense layer of review would any final decision in their favor carry with it that legal presumption. As under the current system, patents filed by individual inventors and small companies would be given a fee discount. Under such a system, patent examiners would be able to streamline their initial reviews—screening out just the clearly non-meritorious applications—and concentrate their limited time and energy on the smaller group of patents where the economic stakes are likely to be larger (based on the willingness of the applicant to pay for more intensive review).

- Rationalizing the "non-obviousness" requirement for obtaining a patent is a job better left to the courts than to the legislature (where the outcome may be determined more by the strength of lobbying interests than by what is in the public interest).

- Developing a more effective and less costly post-grant review procedure for patents to help weed out non-deserving patents before they are misused by their applicants.

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[38] See, e.g. Jaffe and Lerner (2004); Scherer (2006); U.S. Federal Trade Commission, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy* (Washington, D.C.: October 2003); and U.S. National Research Council, *A Patent System for the 21st Century* (Washington, D.C.: National Academies Press, 2004).

[39] This proposal has been advanced by Doug Lichtman, "Aligning Patent Presumptions with the Reality of Patent Review: A Proposal for Patent Reform," Hamilton Project Discussion Paper, The Brookings Institution, December 2006.

Various other proposals to improve the effectiveness of the U.S. patent system in promoting innovation are now under discussion. These include: making proposals to allow third-party challenges to patents at some point *before* patents are actually awarded (on the assumption that such challenges will be less costly and time consuming than post-award lawsuits); adopting the "first to file" system for awarding patents that is prevalent in most countries rather than the "first to invent" standard applicable in the United States; limiting "patent trolls" (firms that acquire patents solely for the purpose of licensing them rather than commercially developing patented technologies) to obtaining damages, but not injunctions, for infringement; and changing the measure of damages for infringement from lost profits to loss of reasonable royalties.

The implications of all these reforms for innovation, especially by entrepreneurs, at this point are unclear. This is because strong patent protection can help entrepreneurs, but also can deter them from entering fields where incumbents have patent protection that may be of dubious merit but deep pockets to prosecute any litigation for infringement. At a minimum, however, two principles for patent reform should draw consensus: (1) patents should only be provided for truly non-obvious inventions; and (2) consistent with the first objective, the procedures for contesting patents should entail minimum cost.

Fortunately, some progress has been made in better achieving the first goal with the Supreme Court's decision this year (2007) in *KSR v. Teleflex*, where the Court struck down the validity of an automobile gas pedal design and announced a new, higher standard for awarding patents. At this writing, Congress is considering patent reform legislation (S. 1145) that, among other things, would require royalties paid by infringers to be calculated solely on the basis of the value of the "non-obvious" features of a disputed patent, not on the value of the product as a whole. This is consistent with court rulings aimed at tightening the non-obvious standard itself.

The proposed legislation also would establish an administrative post-grant opposition procedure, which its supporters argue would lower the costs of patent contests, and thus help achieve the second goal for patent reform. Critics believe, however, that by making it easier to contest patents, Congress would encourage contests against patents filed by entrepreneurial companies with more limited resources than their opponents. The only way to resolve this difference in views is to actually implement the proposed post-grant opposition procedure and see what happens. The downside risks for entrepreneurs could be addressed through a sunset provision, which would require Congressional action in the future to keep such a reform in place.

Importing Business Ideas from Abroad

One of the worst economic mistakes any business, or country, can make is to fall victim to the "not invented here" syndrome—the refusal to adopt something that is developed and used elsewhere. Other countries have certainly improved the

economic welfare of their citizens by licensing or using American technologies (in some cases, at a faster pace, though from a lower starting level, than the United States). And the United States has historically benefited from the production technologies and products developed abroad and introduced by foreign investors, especially in the manufacturing sector. Where would the U.S. manufacturing sector be today without the “just-in-time” production systems or “quality circles” that were pioneered in Japan?

But surely there are other foreign technologies that have not yet been introduced into the U.S. market, but could be by enterprising entrepreneurs or larger companies. It is likely that large, global companies, which have the resources to do so, are following technological developments in at least the product and service markets in which they compete. But the typical entrepreneur or even mid-size firm does not have the resources to do this. The federal government could help level the playing field and in the process enhance opportunities for new entrepreneurial ventures by creating a single body to monitor foreign technical journals and translate them into English. Such an office or organization should be able to take advantage of economies of scale and accelerate the transmission of useful knowledge developed abroad to current and potential entrepreneurs in this country who might find ways of commercializing it here.

REDUCING REGULATORY BURDEN AND UNWARRANTED LIABILITY THREATS

All economies and the actors within them need rules of the road to guide behavior. In market economies, legal protections of property and contract are critical, especially to entrepreneurs, who could not and would not undertake the risks of launching their enterprises without such protections.

At the same time, even with secure rights of property and contract, markets can fail to deliver optimal outcomes. Information about product or workplace risks may not be voluntarily disclosed. Firms can pollute, safe in the knowledge that it is generally too expensive and time-consuming for those harmed to collectively negotiate a better outcome. These are among the reasons governments regulate the activities of private firms and why the legal system permits victims of negligence, whether committed by individuals or companies, to seek compensation for their harm.

Entrepreneurship and business activity generally can suffer, however, if regulation and litigation are carried too far or pursued in ways where costs outweigh benefits. Several ideas for avoiding these outcomes are set forth in the two sections that follow.

Better Regulation

Entrepreneurial firms typically are smaller than their well-established counterparts. This can be an advantage when quick action is required to take advantage of a business opportunity. Entrepreneurial firms don't have the layers of personnel that require signoff before something is done, as is frequently the case in large companies.

But when it comes to complying with legal mandates, smaller companies do not have the large legal and compliance staffs of larger companies and thus typically find compliance to be more expensive, as a share of their total revenue or costs. One study has found, for example, that the total cost of federal regulation is 45 percent greater per employee for firms having less than twenty employees than for firms with more than 500 employees.[40]

That smaller, entrepreneurial firms have greater difficulty complying with broad federal regulatory mandates is the main reason why executive branch regulatory agencies, in designing rules, have been required to minimize impacts on small business, consistent with meeting the agencies' statutory objectives. Agencies are also required under the Regulatory Flexibility Act (RFA) to conduct "regulatory flexibility" analyses of the effects of their proposed and final rules on small business. The Office of Advocacy in the Small Business Administration has been encouraging states to adopt state equivalents of the RFA. The RFA also requires federal agencies to periodically review existing rules and to consider ways to reduce regulatory burdens on small businesses.

The special attention given to the impacts of regulation on smaller business is fine as far as it goes, but there are broader objectives at stake when government regulates. As a matter of principle, no firm in the private sector of any size ought to be subject to regulatory mandates—imposed by any level of government—unless the social benefits of the mandates or rules exceed their costs. Furthermore, it is important that when government does impose regulation to attain a specific social objective—such as cleaner air or water, or safer workplaces—that it do so in the least costly way. If these two principles are not satisfied, government will have "over-corrected" a market failure, imposing needless costs on the private sector, and impairing economic efficiency and growth in the process.

Broadly speaking, federal policy over the past several decades has gradually embraced both of these principles, although more still could be done.

- Since the mid-1970s, presidents from both main political parties have adopted or followed executive orders requiring executive branch agencies

[40] W. Mark Crain and Thomas D. Hopkins, "The Impact of Regulatory Costs on Small Firms," report prepared for the Office of Advocacy, U.S. Small Business Administration, 2001, available at www.sba.gov.

to analyze the benefits and costs of their proposed rules before making them final. An office within the Executive Office of the President—the Office of Information and Regulatory Affairs (OIRA) at the Office of Management and Budget (OMB)—oversees agencies' compliance with this requirement.

- Since 1999, Congress has required OMB (through OIRA) to report on the total benefits and costs of all regulations (including those issued by independent regulatory agencies, although OIRA does not oversee them). Successive reports by OMB have documented that for new rules adopted since 1995, the benefits have exceeded costs in the aggregate, by a substantial margin—although many individual rules still appear to fail a benefit-cost test.[41]

- Regulatory agencies are showing greater interest in promulgating rules that allow for flexibility in compliance. In particular, there is now a widespread consensus that emissions of air pollutants ought to be governed by some type of "cap and trade" system, which puts a ceiling on overall emissions but allows individual actors to trade their rights to emit in market settings. Such regulatory designs achieve a given regulatory objective at the least cost by having the market determine the cheapest ways to control emissions. Other regulations can benefit from mimicking market principles in achieving their statutory objectives.

- In January 2007, the Bush administration revised and improved upon the prior Clinton-era executive order on government regulation and its oversight in three ways. It extended the analytical requirements beyond formal rules to regulatory "guidance" (which is similar to rulemaking). The new Order also required executive branch agencies to provide a written rationale for why they are regulating, a requirement that seems readily justifiable on its face. And the new order required a political appointee to sign off on new regulations, which better ensures political accountability for the development and implementation of new rules.

Still, there is room for improvement. For one thing, not all federal regulatory statutes require the agencies that set rules under them to satisfy a benefit-cost test before issuing those rules. In these cases, OMB may require that a benefit-cost analysis be done, but at best the agency may only be able to take account of that analysis indirectly, if at all, in its decision-making process. Accordingly, Congress should amend its regulatory statutes across the board to require that

[41] See Office of Management and Budget, *2006 Report to Congress on the Costs and Benefits of Federal Regulations and Unfunded Mandates on State, Local and Tribal Entities.* For a critical analysis of the benefits and costs of individual rules, suggesting that about half still fail a benefit-cost test, see Robert W. Hahn and Caroline Cecot, "The Economic Significance of 'Insignificant' Rules," AEI-Brookings Joint Center on Regulatory Studies, Working Paper 0606, September 2006.

the rules all agencies (including independent agencies) meet a benefit-cost test, or where agencies determine that certain benefits cannot be assigned a monetary value that the agencies at least assure that their rules are the most cost-effective of the alternative ways of achieving those benefits. Indeed, all rules should be set in such a way that the costs are minimized for achieving a given objective. Particular attention should be paid to adopting “market-like” approaches to regulation—using tradable permits, performance standards rather than design requirements, and so on—wherever possible.

These recommendations apply to rulemaking going forward, and if adopted, would gradually improve regulatory decision-making and its impact on entrepreneurs and large firms alike. But there is huge body of existing rules, some of which are surely no longer suitable or capable of being modified to be more cost-effective. With limited resources, agencies do not have the ability to go back and rewrite every rule. But it may—indeed should—be possible for agencies to prioritize their existing rules by cost-of-benefit impacts, and then begin to reexamine their rules to see whether changes in circumstances since the rules were first issued call for modifications to the rules, either streamlining, or tightening (where justified). In some cases, revisiting the rule might suggest its elimination (if the costs outweigh the benefits). At the federal level, the Office of Management and Budget could assist the agencies in identifying rules for reexamination and possible approaches for revision.

Ideally, states and localities also should implement the same set of recommendations for both their new and existing rules. Admittedly, this is more difficult for levels of government that do not have the analytical resources of the federal government to carry out the appropriate analyses before issuing rules. But states can work together through existing organizations (such as the National Governors Association and/or the League of Cities), new bodies, or with the assistance of the federal government. Working together, they can establish a clearinghouse of benefit and cost information on individual state and local rules, which may help many jurisdictions around the country to avoid “reinventing the wheel” when they are considering new regulatory mandates, and help them to adopt rules that generate more benefits than costs, and which represent the least costly ways of achieving various regulatory objectives.

Liability Reform

Liability rules can also have the same effect as regulation, resulting in verdicts that in practice set norms for behavior by firms and individuals in specific industries or across many, or all, sectors of the economy. An inherent difficulty with “regulation-by-litigation,” however, is that the rules that emerge from individual, fact-specific litigated cases are decided by randomly chosen juries, in cases that are randomly filed across the country. In a national economy, it is thus somewhat anomalous that a jury in one particular city in a particular state can have the effect of setting national norms, especially if that state is sufficiently

important to a national manufacturer or service provider that it must do business in that state. In the process, therefore, the most restrictive state can have the effect of setting the national norm.

In 2005, Congress recognized enterprising plaintiffs can take advantage of this decentralized legal system and find hospitable locales for bringing suit against companies doing business nationwide. It therefore enacted the Class Action Fairness Act to buttress "diversity jurisdiction" requirements in order to require plaintiffs to file suit in the federal courts where the parties are from different states so as to eliminate or at least cut down such "forum shopping."[42]

Other steps have been taken in recent years to reduce uncertainties about firms' exposures to liability awards, thus improving the climate for entrepreneurial endeavors. Notably, various states have enacted caps on damages on other liability-related reforms that have taken some of the uncertainty out of liability litigation. In its 2003 ruling in *State Farm v. Campbell,* the Supreme Court set forth guidelines for the award of punitive damages, which until recently has taken some of the uncertainty out of the level of punitive damages that can be awarded without violating the constitutional protection of due process. At this writing, however, the court is considering another case involving punitive damages, *Phillip Morris USA v. Williams*, and depending on the outcome, that uncertainty could be further reduced, increased, or not changed.

More could be done in the meantime to reduce further some of the remaining uncertainties surrounding liability rules. One potentially important step, debated in Congress for years but so far without resolution, would be a federal product liability law. National liability rules for products sold in a national market should not be set by multiple states or localities, but instead by federal bodies—the Congress and the federal courts—representing the interests of the entire nation.

A second constructive measure, aimed at deterring frivolous litigation, would be to adopt the "English rule" on payment of attorneys' fees—the loser pays—but only for commercial litigations where there are commercial interests on both sides. A "loser pays" rule for all tort litigation could chill individuals or classes representing them from seeking redress for wrongs committed against them.

A third useful reform would bring greater clarity to punitive damage awards regardless of what the Supreme Court decides about their level, by immunizing defendants from liability for punitive damages where they can prove that their actions complied with prevailing regulatory standards.

In combination, these measures would reduce some of the risks over which entrepreneurs have no control while preserving the rights of injured parties to recover compensation to which they are entitled.

[42] It is possible, however, that plaintiffs and their attorneys will find innovative ways of forum shopping at the federal level, an outcome that the Class Action Fairness Act cannot prevent.

OTHER POLICIES AFFECTING ENTREPRENEURSHIP

This essay has concentrated on the four broad subject areas just analyzed—ensuring a supply of skilled workers, reforming health care, promoting innovation, and reducing regulatory burden and undue litigation—because these are the topics that innovative entrepreneurs tell us are the most important to them and what they believe will be most important to innovative entrepreneurs in the future. At the same time, however, other policies clearly will have an important impact on innovative entrepreneurship and the U.S. economy in the years ahead.

Two prominent examples are how federal policymakers deal with future budget deficits looming because of entitlement programs for the soon-to-be-retiring baby-boom generation, and whether the United States and other countries will backslide or move forward toward further trade liberalization in an environment where increasing numbers of citizens are nervous or skeptical about the value of globalization. Dealing with the long-term budget deficit is important, if not essential, in order to maintain a low-interest rate environment (which makes it easier to finance new ventures) and to avoid financial crises. Open trade is vital because it ensures that all firms (including entrepreneurs) and consumers have access to the least expensive inputs and goods and services, while being able to sell into other markets.

There are two other policy subjects, perhaps closer to entrepreneurs' daily experiences, which also could have an important impact on future entrepreneurial patterns: taxes and access to capital. Yet for reasons elaborated in the next sections, the impact of policies in these arenas is more complicated than may first appear, and each will benefit from further research.

Tax Policy and Entrepreneurship

One of the central tenets of those who study economic behavior is that incentives matter. Simply put, people are more likely to do more of something if they are rewarded for it, and less of it to the degree that they are penalized for doing it.

An obvious question, then, is how tax policy influences entrepreneurial activity. At first blush, one would think that as marginal income tax rates increase on entrepreneurial income—whether realized as personal income to the entrepreneur or as income to a corporation—the after-tax rewards from engaging in entrepreneurial activity decline, and therefore so should the activity itself.[43] But the reality may be very different, yielding some not-so-obvious insights.

For example, one early (and now classic) article on this subject suggested that while higher marginal income tax rates may discourage economic activity in

[43] This is certainly one of the key findings of a study of state-level corporate taxation, among other variables. See Garrett and Wall (2006).

general, they may *encourage* risk-taking of the kind displayed by entrepreneurs.[44] The reasoning is that as tax rates increase, the government bears more of the risk from entrepreneurial endeavors. With more risk-sharing by another party, the entrepreneur's own "risk premium" will be lower, encouraging him (or her) to take more risk.

A much more recent analysis suggests that it is the *shape of the tax schedule* that is more important for entrepreneurs than the actual *level of the marginal tax rate*. In particular, as the tax schedule grows steeper—or more progressive—then the reward for entrepreneurial activity, at the margin, declines.[45] Other analyses find that the level of the marginal tax rate does in fact make a difference, but in a counter-intuitive way: higher marginal tax rates *encourage* self-employment or entrepreneurship.[46] One possible reason is that small business owners can more easily underreport their income, or find ways to deduct some personal expenses, than employees earning wages and salaries.

A further complication is the interaction of personal and corporate income tax rates with incentives to engage in entrepreneurial activity. Generally, individuals launch their enterprises as non-corporate endeavors, and have tax incentives to do so as long as the personal tax rate exceeds the corporate rate. If so, and if they experience losses in the beginning (as many, if not most, entrepreneurs do), then the tax savings are greater if the enterprise is not incorporated (so that the losses can offset the entrepreneur's personal income). When the enterprise begins to be profitable, if the corporate rate is lower than the personal rate, entrepreneurs will want to switch to the corporate form to take advantage of lower taxes (and also because the corporate form is more suitable for an enterprise with employees). Thus, somewhat paradoxically, as the personal income tax rate increases relative to the corporate tax rate, entrepreneurship may be encouraged. Conversely, cuts in the personal income tax rate relative to the corporate rate may discourage entrepreneurship.[47]

In sum, the relationship between taxation and entrepreneurial activity is more complicated than it may appear at first. More research in the future may simplify and better clarify this connection.

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[44] Evsey D. Domar and Richard A. Musgrave, "Proportional Income Taxation and Risk-Taking," *Quarterly Journal of Economics*, 1944, Vol. 58*, pp. 388-422.*

[45] William M. Gentry and R. Glenn Hubbard, "Tax Policy and Entry Into Entrepreneurship," *The American Economic Review*, Vol. 90, No. 2, May 2000, pp. 283-87.

[46] See Donald Bruce, "Effects of the United States Tax System on Transitions into Self-Employment," *Labor Economics*, 2000, Vol. 7, pp. 545-74 and Herb Schuetze, "Taxes, Economic Conditions and Recent Trends in Male Self-Employment: A Canada-US Comparison," *Labor Economics*, 2000, Vol. 7, pp. 507-44.

[47] For a comprehensive analysis of these interactions, see Julie Berry Cohen and Roger H. Gordon, "Taxes and Entrepreneurial Activity: Theory and Evidence for the U.S.," NBER Working Paper 9015, June 2002.

Financing Entrepreneurship: Regulation of Capital Markets and Corporate Governance

One of the reasons for America's entrepreneurial success surely lies in its well-developed financial system. If they don't have the wealth on their own to launch their enterprises (which most of them do), entrepreneurs with good ideas can and do borrow against their homes or on their credit cards to get started.[48] A few begin with bank financing. Others, often (but not always) among the most promising of companies, are backed from the beginning by venture capital funds and increasingly "angel" investors or groups. Highly developed securities markets, in turn, have enabled third party investors to "liquefy" those investments with potentially large gains if the enterprises are "taken public." To be sure, there are imperfections in this system—pockets of discrimination by some lenders appear to remain, for example, and a common complaint among entrepreneurs is that they have difficulty finding capital—but on the whole good business ideas in America seem to get funded, one way or another.[49]

Various government policies have facilitated the development of this many-layered system of entrepreneurial finance:

- The packaging of mortgages into securities that are now generally sold in the capital markets is an activity that was spurred by federal guarantees and government or quasi-government agencies (the housing finance agencies: Ginnie Mae, Fannie Mae, and Freddie Mac). Only after residential mortgages were "securitized" did credit cards and other kinds of loans follow. Securitization has effectively expanded the supply of capital available for mortgages and credit cards, and thus helps explain why these sources of financing are used heavily by many entrepreneurs in the early stages of their businesses.

- The Small Business Administration (SBA) guarantees loans for smaller businesses, and almost surely is the government agency that is most identified with promoting entrepreneurship. SBA lending, in fact, helped a number of highly successful innovative companies—Apple, Federal

[48] According to the 2002 *Survey of Business Owners* published by the Census Bureau, 60 percent of business owners used their own money to get started, and 49 percent of businesses are operated out of the owner's home.

[49] For evidence of lending discrimination, see David Blanchflower, Philip B. Levine, and David J. Zimmerman, "Discrimination in the Small Business Credit Market," *Review of Economics and Statistics*, Vol. 85, Issue 4, November 2003, pp. 930-43 and Lloyd Blanchard, Bo Zhao and John Yinger, "Do Credit Market Barriers Exist for Minority and Women Entrepreneurs," Center for Policy Research Working Paper No. 74 (Maxwell School of Citizenship and Public Affairs, Syracuse University, 2005).

Express, and Intel—get their start.[50] The U.S. financial system is much deeper, however, than when these earlier "successes" were recorded. It is an open question how important SBA lending remains today to truly innovative businesses that either are self-financed or which receive venture or angel funding.

- Changes by the Labor Department in rules governing permissible investments by pension funds helped spur the rapid growth of the venture capital financing industry.

- The federal government, specifically the Congress and the Securities and Exchange Commission, has played an important role in facilitating the growth of U.S. equities markets. Disclosure requirements adopted during the Depression helped restore battered public confidence in the markets, and are widely seen as essential to maintaining that confidence today.

Corporate financial reporting scandals in the recent past, however, caused widespread consternation among investors and policymakers. Congress reacted by enacting the Sarbanes-Oxley Act of 2002. Among other things, "SOX" imposed stiffer auditing requirements on public companies, required CEOs to certify the accuracy of their companies' financial statements on pain of criminal penalties, subjected auditors to oversight by a new regulatory body (the Public Company Accounting Oversight Board) and prohibited them from engaging in consulting business for clients they audited. The New York Stock Exchange and the NASDAQ changed their listing requirements, requiring a majority of corporate boards to have "independent" directors. These policy changes were accompanied by numerous lawsuits against the companies involved, their directors, and their accountants.

The wisdom of each and all of these measures and activities has been and almost surely will continue to be actively debated. Two major expert reports have suggested that the post-scandal reforms have gone too far and now threaten the continued dominance of U.S. equities markets in the global financial marketplace.[51] Critics have rejoined that equities exchanges in other, rapidly growing parts of the world were bound to catch up to the United States in any event, and that the post-scandals reforms were necessary to restore confidence in U.S. public companies, the auditing networks that certify their financial statements, and in the U.S. equities markets themselves. Other evidence suggests that stepped-up judicial prosecution and enforcement actions by the SEC alone would have been sufficient to deter future corporate misconduct,

[50] Small Business Administration, "SBA: 50 Years as America's Small Business Resource," available at www.sba.gov/50/history.html.
[51] See Committee on Capital Markets Regulation, *Interim Report of the Commission on Capital Markets Regulation,* November, 30, 2006 and Mayor Michael Bloomberg and Senator Charles Schumer, "Sustaining New York's and the US' Global Financial Services Leadership," January 2007.

without the need for a whole new statute (Sarbanes-Oxley) and its accompanying regulations.[52]

All of these issues are important, but they are not immediately relevant to innovative entrepreneurship, the topic of this essay, and one that may be of larger importance to the U.S. economy in the long run. Instead, the various requirements now imposed on public companies and their management, coupled with continued exposure to litigation from shareholders for various reasons, raise two issues that *are* directly relevant to the future of entrepreneurship in America, both among new firms and existing large enterprises.

First, to what extent is the cumulative weight of regulation and exposure to litigation, along with the pressure to announce and meet quarterly earnings targets, driving successful entrepreneurs to sell their companies to larger enterprises or to private equity firms rather than to "take their companies public" by selling only a portion of the companies' stock on public markets? And if the balance has tilted toward "selling out" rather than "going public," is that harmful or beneficial to the economy over the long run?

On the surface, it looks like more successful entrepreneurs are choosing to sell out—prominent examples being the relatively early-stage sales of Skype, YouTube, and MySpace. Yet it can be dangerous to generalize from anecdotes where one doesn't have a good handle on what economists call the "but for" world, or what would have happened in each of these cases, and others, in an alternative, less regulatory, less litigiousness, and more patient investor environment. The same critique applies to those who point to the apparent large numbers of Initial Public Offerings (IPOs) planned for 2007 as evidence that the new regulatory environment has not changed entrepreneurs' preferences for what they want to do after their companies have reached a certain scale. Even if IPOs will be up in 2007, who knows how many more of them might occur in an alternative environment?

Furthermore, even if it is true that the cumulative effect of all the factors cited has tilted entrepreneurs toward selling out, what long-run impact, if any, will that have on the economy? Our hypothesis, and that is all it is at this point pending the outcome of future academic research, is that the entrepreneurial enterprises that are sold to larger enterprises are likely to be less successful and thus not grow as rapidly as they would if taken public. Larger organizations are more likely to snuff out or at least dampen the entrepreneurial energy that led to the

[52] Former Federal Reserve Board Chairman Alan Greenspan voiced this view before a Department of Treasury-sponsored conference on capital markets in March 2007. See Deborah Solomon, "Moving the Market – A Summit on U.S. Rules: Too Gash-Darn Complex," *The Wall Street Journal*, March, 14, 2007. For an academic view, see Kenneth Lehn, "Reforming Regulation of Corporate Governance," *Networks Financial Institute Policy Brief No. 2006-PB-19*, November 2006 (available through http://ssrn.com/abstract=947897). Other participants at the March 2007 Treasury conference voiced a different view, as have other academic scholars.

entrepreneurs' success in the first place. This is especially true if the entrepreneurs and their key staff migrate or are forced out as part of the sale.

For example, what would have happened to Microsoft had its founders sold out to IBM or another technology company in the 1980s rather than remain independent? The same question goes for Intel, Wal-Mart, Cisco, or any number of other hugely successful entrepreneurial enterprises of our time. We suspect in each case the buyer would not have grown the company and developed its full potential, along with the products and services it provided. If this is true, then it would seem to matter a great deal whether the cumulative effect of recent changes in the regulatory and legal environment relating to corporate governance has driven or will continue to drive more successful entrepreneurs to sell out than would otherwise be the case.

A second set of issues arising from the recent corporate governance and accounting reforms is what impact they are having and will continue to have on the willingness of *large companies* to take entrepreneurial risks, and thus in turn to contribute to economy-wide productivity growth. Of course, as discussed earlier, such companies generally shy away from risk-taking on a large scale, preferring instead to focus their energies on incremental innovations, gradual refinements of existing products and production processes. Nonetheless, could the cumulative impact of the various reforms, coupled with the pressures of remaining public, be affecting even this process of incremental innovation, let alone the prospect that large companies will introduce breakthrough products, services, and technologies (as large companies occasionally do, hybrid cars introduced by Honda and Toyota, and the iPod by Apple, being prime examples)?

Again, these are hypotheses that require testing by more rigorous analysis. Advocates of the recent reforms point to the greater professionalism of corporate directors, and the closer attention they are paying to the affairs of their corporations, as evidence that corporations are less likely to waste their resources than in the past. In addition, even if the reforms are causing more public companies to "go private"—that is, to be sold to private equity firms flush with rising amounts of cash—this may be a good thing, since private equity managers may be more patient than public investors toward investing in riskier R&D projects with long-term payouts. In addition, private equity ownership ensures greater scrutiny by owners of corporate managers than a diffused base of public shareholders (even if some or much ownership may be concentrated in a handful of institutional investors).

There are opposing hypotheses. Directors may be more independent than in the past, but they may not be as well informed about the particular company or even business in general (if they are from academia or have political backgrounds). Management may find it more difficult to take entrepreneurial risks with a less experienced board. This may be especially true where new board members,

fearful of their liability exposure or their reputations, attempt to micro-manage decisions by corporate CEOs. As for the trend toward more private buy-outs, it is unclear whether the purchasers will be truly interested in long-term growth, or instead in cost-cutting and other “financial window dressing” so that they can quickly resell the companies—to other groups of private investors, or back to the public. Further, efforts by some companies to avoid being bought out by private equity firms by taking on increased debt to make the companies look less attractive for purchase, also can damage the long-term growth prospects of the firms by forcing cutbacks in expenses and R&D.

In short, the verdict is still out on the impact of the recent corporate governance reforms and the litigation environment on innovation, both by growing entrepreneurs and established companies. More time and more research will be required to provide more definitive answers to the various hypotheses posed here.

CONCLUDING THOUGHT: INNOVATIVE ENTREPRENEURSHIP IS LARGER THAN SMALL BUSINESS

Readers of this essay expecting to find discussions of the usual policies aimed at promoting small business—preserving or expanding the volume of small business loans guaranteed by the Small Business Administration (SBA), expanding funding for research undertaken by small business under the Small Business Innovation Research (SBIR) program, or extending opportunities for small business to receive a portion of government contracts—may be surprised, and perhaps disappointed that these subjects were not mentioned, until now. Instead, this essay has concentrated on a set of larger issues—immigration policy, education, innovation policies, regulation, and litigation—that, in our view, are more important and relevant to the future of truly innovative entrepreneurship in this country.

At the outset of this essay, we pointed to a number of technologies Americans (and citizens throughout the world, for that matter) now take for granted that were introduced by entrepreneurs—telephone service, the automobile, airplane, air conditioning, the personal computer, and accompanying software. None of us can know what promising new technologies await us in the future. But if the past is any guide to the future, then one thing is virtually certain—most of them will be developed by entrepreneurs.

The challenge for policymakers at all levels of government is to create an environment where citizens from all walks of life have the opportunity to become innovative entrepreneurs. We hope this essay will help spur a national—and perhaps also a global—conversation about how best to achieve this vital goal. We encourage all readers to join this conversation with us, with other citizens, and with policymakers to ensure this result.